

## ***What types of improvements will be made?***

### **Lane Improvements**

WSDOT will realign and reconstruct I-405 to add two, 12-foot general-purpose lanes in both the northbound and southbound directions (Exhibit 4-2). The roadway will be improved with approximately 10-foot inside shoulders (to the driver's left) and 12-foot outside shoulders (to the driver's right) in both directions. The freeway design will include a four-foot painted buffer to separate the general-purpose lanes from the inside HOV lane (see northbound and southbound inserts in Exhibit 4-2). In addition to adding the new lanes, the existing lanes will be reconstructed.

Intelligent transportation system (ITS) features will be incorporated into the project. In addition to the planned ramp meters, these features may include electronic variable message signs, highway advisory radio, and enhanced data and communication equipment for incident response. The specific ITS components will be determined during the final design phase of the project.

### **Transit and HOV System**

WSDOT uses the term bus rapid transit (BRT) to describe high-frequency bus service that incorporates capital facilities designed to increase travel speed, reliability, and passenger convenience and comfort. The Renton to Bellevue Project proposes many elements of BRT including maintaining HOV lanes, providing HOV bypasses where ramp meters exist, construction of a transit/HOV direct-access ramp, an in-line BRT station, and park-and-ride lot expansion.

### ***HOV Lanes***

WSDOT will maintain one HOV lane in each direction. The project includes a buffer area, envisioned as a four-foot-wide strip of painted pavement separating the general-purpose lanes from the HOV lane. Access to the HOV lanes will be at the direct-access ramps and at specific locations along I-405.

WSDOT will reconstruct the eight interchanges in the Renton to Bellevue project area with ramp meters that give HOV and transit priority over single-occupant vehicles.

### *Transit/HOV Direct-Access Ramps*

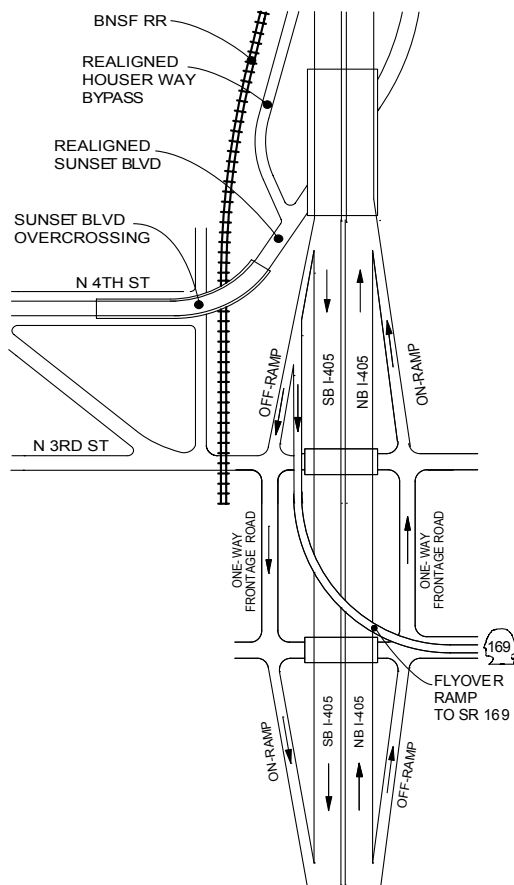
In conjunction with Sound Transit, WSDOT will construct a transit/HOV direct-access ramp at N 8th Street that will allow buses and other HOVs to efficiently enter and leave I-405. The direct-access ramps will eliminate the need for transit, carpools, and vanpools to weave across mainline traffic to exit or enter the freeway HOV lane.

### *In-line Transit Station*

WSDOT will construct a new in-line transit station on I-405 in the vicinity of the 112th Avenue SE interchange. The facility will include a pedestrian bridge over the northbound I-405 mainline lanes to the Newport Hills Park-and-Ride lot. The in-line transit station will eliminate the need for buses to leave the corridor to serve riders. The Newport Hills Park-and-Ride lot will be expanded to add approximately 150 more spaces.

### **Interchange Improvements**

**Exhibit 4-3: Reconfiguration of the SR 169 interchange area**



Because I-405 is being widened to add two new lanes in each direction, interchange bridges will need to be replaced with longer and/or wider structures to accommodate the new lanes. WSDOT will reconstruct the interchange overcrossings/ undercrossings so that they are in compliance with the Americans with Disabilities Act (ADA). Pedestrian and bicycle facilities will also be provided at many locations. Ramp meters will be installed on all on-ramps except at the I-90 interchange.

### *SR 169 to N 3rd Street Interchange Area*

WSDOT will make the following improvements between SR 169 and N 3rd Street (Exhibit 4-3):

- Widen the northbound off-ramp to SR 169 and the southbound on-ramp south to I-405;
- Construct a one-way, three-lane frontage road northbound from SR 169 to N 3rd Street on the east side of I-405;
- Realign and reconstruct Sunset Boulevard N as a one-way, two-lane frontage road from N 3rd Street to SR 169;

- Realign and improve Sunset Boulevard as a T-intersection with the Houser Way Bypass (the Houser Tunnel will be eliminated);
- Construct a new on-ramp with HOV bypass from N 3rd Street to I-405 northbound; and
- Construct an off-ramp from southbound I-405 to N 3rd Street and a direct connector flyover to southbound SR 169.

#### *N 8th Street HOV Direct Access*

In coordination with Sound Transit, WSDOT will make the following improvements at N 8th Street (Exhibit 4-4):

- Reconstruct and widen N 8th Street to accommodate transit/HOV direct access ramps;
- Construct an HOV ramp over Houser Way N, the Burlington Northern Santa Fe Railway (BNSF) tracks, the entrances to PACCAR and Java Trading and the southbound I-405 lanes; and
- Construct on- and off-ramps to both northbound and southbound I-405 HOV lanes.

#### *Park Avenue (SR 900) Interchange Area*

WSDOT will make the following improvements to Park Avenue (SR 900) (Exhibit 4-5):

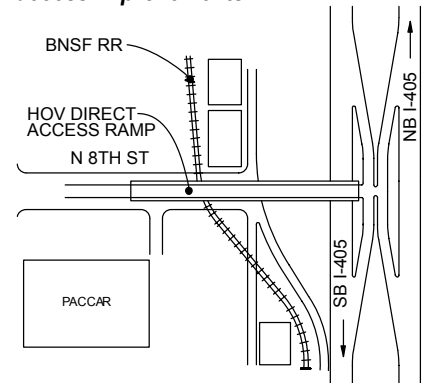
- Replace the I-405 bridges over Park Avenue with longer and wider bridges and reconstruct on- and off-ramps to accommodate the mainline widening; and
- Realign and widen Park Avenue to accommodate right- and left-turn lanes in the vicinity of the interchange.

#### *NE 30th Street Interchange Area*

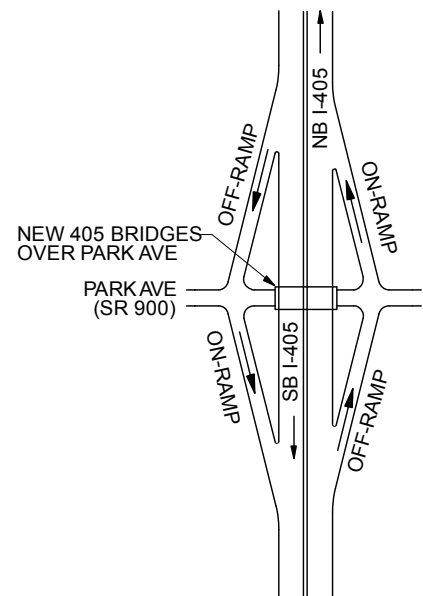
WSDOT will make the following improvements to the NE 30th Street interchange (Exhibit 4-6):

- Construct a northbound auxiliary lane between the Park Avenue on-ramp and NE 30th Street off-ramp;
- Widen NE 30th Street, from Meadow Avenue N to the Kenndale Elementary School to accommodate turn lanes at the interchange and add signals at the intersections with the I-405 ramps; and
- Replace the NE 30th Street bridge over I-405.

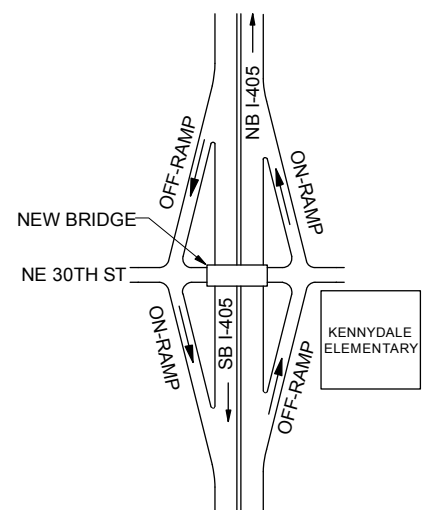
**Exhibit 4-4: N 8th Street HOV direct access improvements**



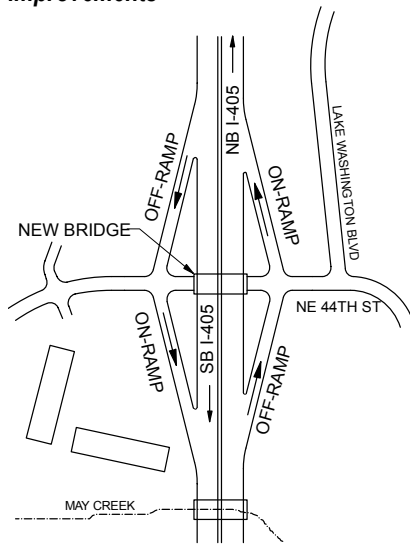
**Exhibit 4-5: Park Avenue interchange improvements**



**Exhibit 4-6: NE 30th Street interchange improvements**



**Exhibit 4-7: NE 44th Street interchange improvements**



#### **NE 44th Street Interchange Area**

WSDOT will make the following improvements to the NE 44th Street interchange (Exhibit 4-7):

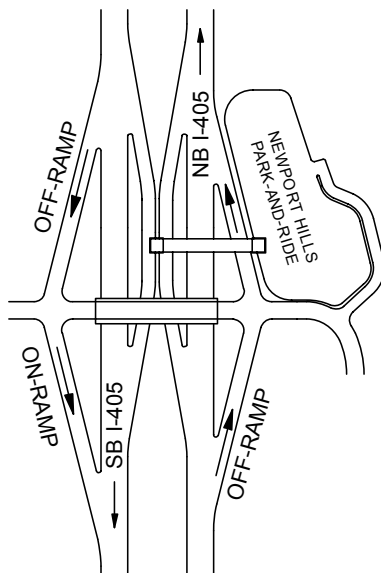
- Construct northbound and southbound auxiliary lanes between the NE 30th Street and the NE 44th Street on- and off-ramps;
- Replace the NE 44th Street bridge with a longer and wider bridge and reconstruct the on- and off-ramps to accommodate the mainline widening; and
- Reconstruct the northbound and southbound I-405 bridges over May Creek.

#### **112th Avenue SE Interchange Area**

WSDOT will make the following improvements to the 112th Avenue SE interchange (Exhibit 4-8):

- Replace the 112th Avenue SE bridge with a longer and wider bridge and reconstruct the on- and off-ramps to accommodate the mainline widening and HOV bypass;
- Construct a new in-line BRT station in the vicinity of 112th Avenue SE with a pedestrian bridge over the northbound I-405 mainline lanes to the Newport Hills Park-and-Ride lot; and
- Expand the Newport Hills Park-and-Ride lot by approximately 150 more spaces.

**Exhibit 4-8: 112th Avenue SE interchange improvements**



#### **Coal Creek Parkway Interchange Area**

WSDOT will make the following improvements between the 112th Avenue SE interchange and Coal Creek Parkway (Exhibit 4-9):

- Construct a northbound auxiliary lane between 112th Avenue SE and I-90;
- Construct longer and wider northbound and southbound I-405 bridges to span both Coal Creek Parkway and Coal Creek;
- Reconstruct a portion of the Lake Washington Trail;
- Reconstruct the on- and off-ramps to accommodate the mainline widening and HOV bypass; and

- Construct a southbound auxiliary lane between the Coal Creek Parkway and the 112th Avenue SE on- and off-ramps.

#### ***Coal Creek Parkway to I-90 Area***

WSDOT will make the following improvements between Coal Creek Parkway and I-90 (Exhibit 4-9):

- Construct a northbound braided on-ramp from Coal Creek Parkway to I-405 crossing under the I-405 off-ramp to I-90 (access from Coal Creek Parkway to I-90 will be accommodated);
- Add a new northbound lane over I-90 by restriping the existing bridge;
- Convert the existing southbound structure to a northbound HOV lane;
- Reconstruct the I-405 southbound off-ramp to I-90 on a new alignment to accommodate widening of I-405;
- Construct a new five-lane southbound bridge over I-90, to the west of, and adjacent to, the existing southbound bridge;
- Construct a southbound braided off-ramp from I-405 to Coal Creek Parkway, crossing over a reconstructed southbound on-ramp from I-90 (access from I-90 to Coal Creek Parkway will be accommodated).

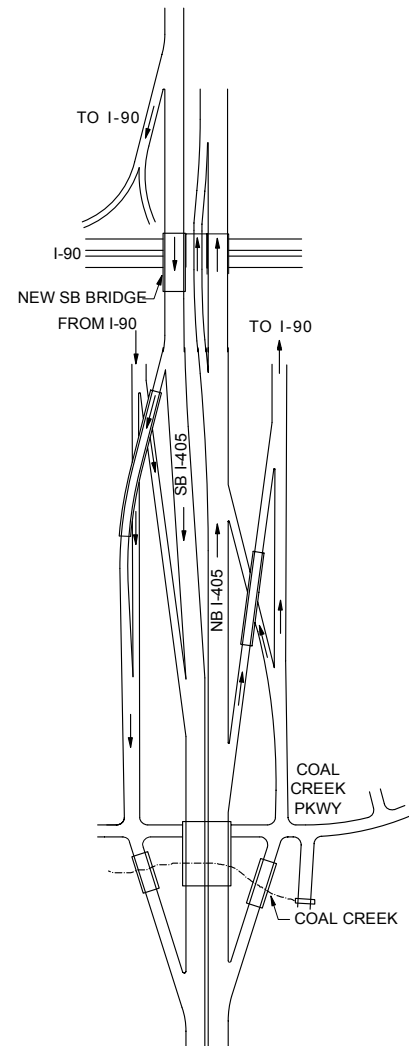
#### **Other Improvements**

##### ***Local roadway improvements***

WSDOT will realign or widen some local streets. Specific project improvements include:

- Install a new traffic signal at the intersection with N 3rd Street and the new northbound frontage road;
- Realign Sunset Boulevard (SR 900) as a T-intersection with the Houser Way Bypass, rather than merging at an angle;
- Realign Sunset Boulevard and Houser Way Bypass to form a new intersection with N 4th Street;
- Remove the Houser Way tunnel;

***Exhibit 4-9: Coal Creek Parkway to I-90 interchange improvements***



- Close off a portion of Grandey Way NE/Windsor Way NE nearest I-405 and construct cul-de-sacs at the termini;
- Widen NE Park Drive (SR 900) from Aberdeen Avenue NE to the bridge over the BNSF tracks to accommodate turn lanes;
- Widen NE 30th Street, from Meadow Avenue N to the Kenneydale Elementary School to accommodate turn lanes at the interchange and add signals at the intersections with the I-405 ramps;
- Widen NE 44th Street, from NE 30th Place (SE 80th Street in Newcastle) to the vicinity of Hazelwood Lane, including reconstruction of the intersection with Hazelwood Lane, for turn lanes;
- Relocate a portion of Lake Washington Boulevard SE approximately 200 feet to the east so that the NE 44th Street interchange can be reconfigured; and add signals at the intersection with the I-405 ramps;
- Remove 109th Avenue SE and adjacent properties purchased for widening of I-405;
- Realign 112th Avenue SE within the vicinity of the 112th Avenue SE interchange and add signals at the intersection with the I-405 ramps and reconstruct a portion of Lake Washington Boulevard SE; and
- Widen Coal Creek Parkway from 120th Avenue SE to 124th Avenue SE for an additional eastbound lane. As part of this widening, WSDOT may construct a multi-use boardwalk (timber trail) in Coal Creek Park adjacent to the roadway.



**Existing noise wall**

#### ***Retaining walls***

WSDOT will construct retaining walls along much of the project. Retaining walls will be used to limit areas of extensive cuts and fills and reduce the project footprint and, consequently, reduce impacts to adjacent properties and environmentally-sensitive areas. Fill walls will be used to confine the fill material used to support the mainline. Cut walls will be used to confine the earth that remains after material has been cut from adjacent hillsides. Retaining walls will also be necessary at the approach roads.

WSDOT is proposing to construct four new noise walls in the project area and reconstruct five existing noise walls closer to the edge of the right of way to reduce noise effects. These nine noise walls (new and reconstructed) will have a total length of almost 3 miles; the locations of new noise walls are identified in Exhibit 4-2. The noise walls will be built only if desired by the neighborhood residents.

Construction of the Renton to Bellevue Project will require crossing 22 streams. Coal Creek and May Creek will be bridged, while other streams crossing under I-405 will remain in culverts. In a number of cases, existing culverts will be replaced with new fish-friendly structures. The stream crossings are summarized in Appendix B, which also lists the project activity associated with each stream. Stream crossing locations are shown in Exhibit 4-10.

- Clover Creek crossing – a new fish-friendly culvert and new stream channel;
- Gypsy Creek crossing – two new fish-friendly culverts;
- Steam 08.LW-7.7A crossing – new fish-friendly culvert;
- Stream 08LW-7.8 crossing – new fish-friendly culvert; and
- Coal Creek crossing – replacement of culvert with a bridge.

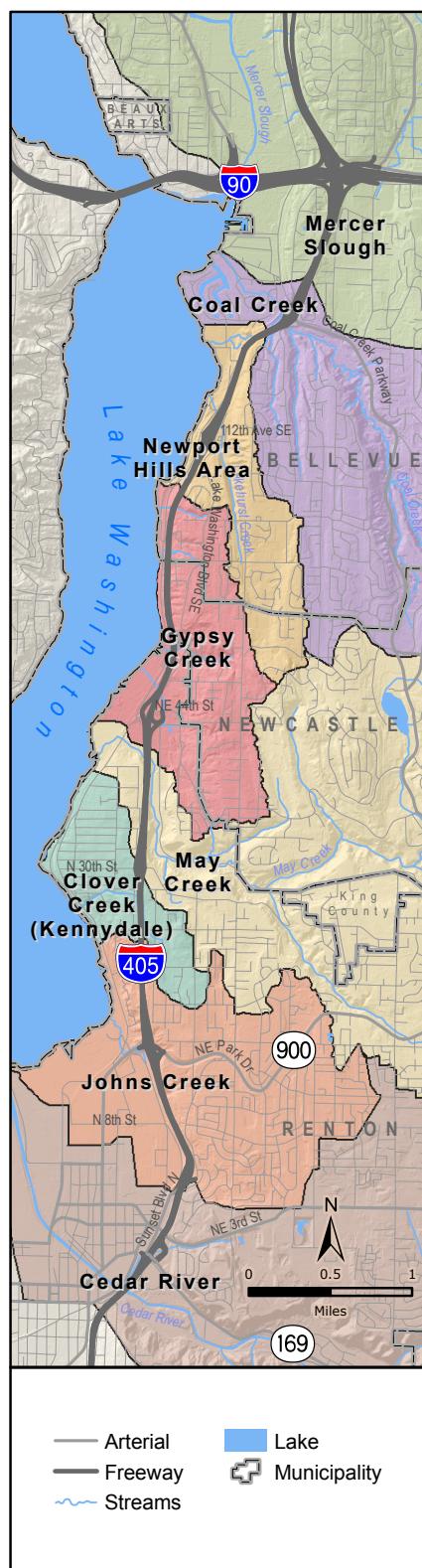
## Stormwater Design Standards

The I-405 Renton to Bellevue Project spans eight primary watersheds or drainages that drain to Lake Washington. The watersheds, listed from south to north, are:

**Legend:**

- New Fish-friendly Structure
- Stream Crossing
- Streams
- Arterial
- Freeway
- Lake
- Park
- Municipality

**Exhibit 4-11: Watersheds**



- Cedar River
- Johns Creek
- Clover Creek (Kennydale Area)
- May Creek
- Gypsy Creek
- Newport Hills Area (a collection of small drainages)
- Coal Creek
- Mercer Slough

The approximate watershed boundaries are shown in Exhibit 4-11. The watersheds are further broken down into on-site and off-site drainage subbasins. The on-site subbasins are project areas where the stormwater is contained and treated prior to discharge into the local aquatic environment. Each on-site subbasin, called a threshold discharge area, drains treated stormwater to a single existing discharge location within 0.25 miles downstream of the freeway.

Drainage from off-site subbasins will be usually kept separate from the on-site drainage, passing through the highway corridor in bridges, culverts, or cross-drain storm drains. Some off-site drainage modifications will include improvements for fish passage and flow capacity. Otherwise, the off-site drainage will not be treated and will continue to pass under I-405 as it currently does.

Stormwater from project area subbasins will be collected and conveyed according to the safety and hydraulic criteria contained in the *WSDOT Hydraulics Manual* (2004). The project will be constructing a new collection and conveyance system that will use, for the most part, new inlets and storm drain pipes. Prior to discharge, the new and replaced pavement runoff will be treated for water quality. The peak rate and duration of discharge will be controlled to mimic the theoretical flows as if the area was in a natural land cover condition, which would release runoff at a much slower rate than the urban land cover that exists today. Where stormwater can be directly discharged to either the Cedar River or Lake Washington, WSDOT will not be required to control discharge rates. Water quality and flow control performance will be designed and constructed in accordance with the *WSDOT Highway Runoff Manual*, March 2004.

## Stormwater Treatment Facilities

The Renton to Bellevue Project will provide water quality treatment for the new and replaced project pavement areas. A total of approximately 176 percent of new pavement area will be treated for water quality (see Exhibit 4-12). The primary treatment for the I-405 Corridor area will be by ecology embankment (see Exhibit 4-13). Best management practices (BMPs), such as wet ponds or vaults, will be required for some of the city street improvements.

**Exhibit 4-12: Summary of runoff treatment by watershed**

Watershed	Existing Lanes and Shoulders (Impervious Area <sup>1</sup> ) (acres)	New Lanes and Shoulders (Impervious Area) (acres)	Total Lanes and Shoulders (Impervious Area) Treated (acres)	Percent of New Lanes and Shoulders (Impervious Area) Treated
Cedar River	17	16	33	190%
Johns Creek	39	17	56	152%
Gypsy Creek <sup>2</sup>	51	45	96	88%
Newport Hills Area	21	35	56	267%
Coal Creek	13	2	15	117%
Mercer Slough	21	9	30	141%
<b>Project Total</b>	<b>162</b>	<b>124</b>	<b>286</b>	<b>176%</b>

*(Numbers have been rounded)*

<sup>1</sup> Includes I-405, interchanges, and some surface streets where construction will occur.

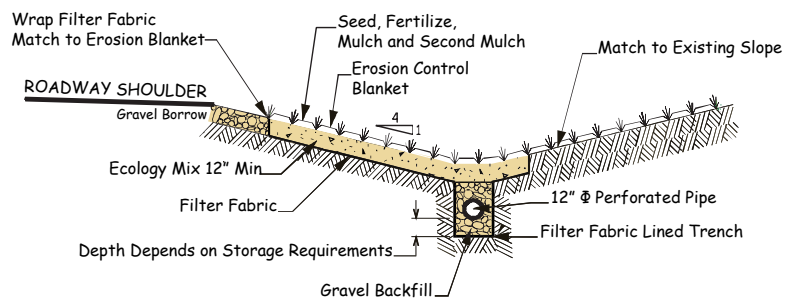
<sup>2</sup> Includes impervious areas in the Clover Creek and May Creek watersheds, since no stormwater is discharged to either of these two watersheds.

### What is an ecology embankment?

An ecology embankment is a linear stormwater treatment and conveyance feature that infiltrates and filters runoff from roadway shoulders.

Ecology embankments are the preferred method of treatment because of their flexibility in construction and maintenance, enhanced treatment capabilities, and relatively low cost. The use of ecology embankments actually exceeds the HRM requirements, since direct discharge to Lake Washington only requires “basic treatment” instead of this proposed “enhanced treatment” type of BMP. WSDOT is proposing to construct a total of 17 ecology embankments in the project area that total

**Exhibit 4-13: Ecology embankment cross-section**



approximately 3,800 linear feet and cover approximately 127,000 square feet.

WSDOT is proposing to construct water quality treatment facilities at N 8th Street, in the Johns Creek Watershed at MP 4.4, and in the Mercer Slough Watershed near the I-90 interchange.

**What is direct discharge?**

Direct discharge refers to release of stormwater to a large body of water without prior detention.

A final determination of the exact treatment facilities (for example, placement, size/capacity, and mix of quantity and quality treatment) necessary to meet highway runoff discharge criteria has not yet been made.

WSDOT is exploring several approaches to collection, treatment, and discharge of stormwater from I-405 in the vicinity of Coal Creek and Newcastle Beach Park. The most innovative approach would collect I-405 stormwater, treat it, and divert it away from Coal Creek into a channel that flows directly into Lake Washington through Newcastle Beach Park. This approach avoids adding more I-405 stormwater to Coal Creek, which currently experiences flooding and water quality problems. One of the features of this plan is that it would include City of Bellevue stormwater and local groundwater as part of the discharge to Lake Washington. This approach discharges treated stormwater through an existing stream channel that runs along the park entrance road, crosses the road, and flows into Lake Washington just south of the park's recreation area. Wetland, stream, and park enhancements may be provided with this approach. The enhancements may include parking lot improvements to eliminate flooding and pedestrian access improvements across the channel. Improvements will be coordinated with the City of Bellevue. WSDOT may also choose a more conventional method of

stormwater management that would provide treatment and detention in vaults or ponds and subsequent discharge to Coal Creek.

### **Stormwater Flow Control**

Project stormwater will be treated and then discharged directly to either the Cedar River or Lake Washington. Stormwater detention is not required for discharge to Lake Washington or the Cedar River, because these water bodies are so large that no measurable increase in hydraulic conditions and velocities will occur with the increased runoff.

### **Drainage Collection and Conveyance**

Due to the reconfiguration and new construction of the highway for this project, almost all of the existing drainage system will need to be replaced. Ecology embankments on the edge of the roadway shoulders will be used as the preferred conveyance method; however, where the corridor is tightly confined by adjacent property development and sensitive areas, stormwater collection will be done using inlets and pipes.

In addition to ecology embankments, proposed collection and conveyance systems will consist of standard WSDOT catch basin and manhole structures connected to the treatment and flow control facilities. Pipe sizes will generally range from 12 to 30 inches in diameter and be installed on grades and at depths necessary for proper vertical clearances and stormwater flow. Inlets will be placed at specific locations to limit the spread of stormwater into the travel lanes, as required by the WSDOT Hydraulics Manual.

### **Culverts**

WSDOT anticipates that improvements to the freeway mainline and associated interchanges will impact the existing cross-culverts. Since the highway is being reconfigured and the age of the culverts exceeds their design lifespan, WSDOT expects that most of the existing culverts will be replaced; five of the culverts will be replaced with fish-friendly structures.

### **Right of Way Requirements**

WSDOT will acquire approximately 44 acres of land for right of way. This new right of way will be used for construction of additional lanes on the I-405 mainline, reconstruction of the interchanges, construction of the transit/HOV direct access

ramps, and realignment of local roadways. Additional properties will be acquired for environmental enhancements, such as wetland mitigation and stormwater facilities.

At this stage of project design, WSDOT estimates that the Renton to Bellevue Project will affect approximately 163 parcels: 102 properties within the City of Renton (53 commercial, 48 residential, and 1 publicly-owned); 51 in Bellevue (4 commercial and 47 residential); and 10 in Newcastle (all residential). Of the affected parcels, 105 are residential (43 partial and 62 full acquisitions) and 57 are commercial (38 partial and 19 full acquisitions).

### ***How will the project incorporate community design preferences?***

The Renton to Bellevue Project is being planned, developed, and designed in accordance with guidelines called Context Sensitive Solutions (CSS), also referred to as Context Sensitive Design. These guidelines provide a means of incorporating community design preferences into the project.

### ***How are Context Sensitive Solutions guidelines being incorporated?***

The guidelines that were developed with each of the communities have been incorporated into the aesthetics and urban design elements throughout the corridor. These design elements include abutment walls ornamented with organic geometric designs and patterned stone finish, pedestrian-scale lights of enhanced design for walkways under and over the bridges. These lights are similar to those found at Renton's downtown Transit Station/Urban Center. Other elements include sidewalk designs, consistent color schemes to concrete and metal surfaces, new noise wall patterns including design for transitions from existing to new, and enhanced landscaping that blends with the natural environment.

### ***How does the Context Sensitive Solutions process work?***

Working with the public and elected officials, WSDOT developed design themes to be used with future improvements along the corridor. WSDOT's CSS team prepared illustrations and photos of design features, beginning with examples of local baseline design, and compared them to options implemented in other parts of the country. Committee preferences were then narrowed down to

#### **What are Context Sensitive Solutions?**

Context Sensitive Solutions is a design process that incorporates community values on appearance, the environment, mobility, and safety. WSDOT incorporated CSS into the design of the facility by working with local agencies and citizens on the "look and feel" of the project design.

features that could be incorporated into the Urban Design Guidelines Manual (unpublished) for the I-405 Corridor. These preferences were later reviewed by WSDOT's Technical Committee and others within corridor jurisdictions to ensure they fit with corridor-wide features and maintenance standards.

### ***How will the project be constructed?***

WSDOT expects to construct this project using a design-build contract. Design build is a method of project delivery in which WSDOT executes a single contract with one entity for design and construction services to provide a finished product. With design-build projects, contractors have the flexibility to offer innovative and cost-effective alternatives to deliver the project. None of the design modifications that the contractor may make will affect the project footprint or project effects described in this environmental assessment. All WSDOT design standards, performance measures and activities to avoid or minimize effects to the environment will be met.

Project construction is expected to last from three to five years. The at-grade roadway construction work will include the removal of existing asphalt and concrete surfaces, clearing and grading adjacent areas, laying the aggregate roadway foundation, and placing of asphalt and concrete surfaces. Changing the vertical and horizontal alignments of the I-405 mainline will require substantial earthwork, with approximately 2.7 million cubic yards of cut and approximately 2.2 million cubic yards of fill.

Construction equipment such as backhoes, excavators, front loaders, pavement grinders, jack hammers, pile drivers, trucks, as well as grading and paving equipment will be used. Equipment used for construction will include cranes, pile drivers, drilling rigs and augers, backhoes and excavators, jack hammers, concrete pumping equipment, and slurry processing equipment.

Staging areas in unused right of way will provide room for employee parking, large equipment storage, and material stockpiles. Construction staging will not be permitted within the Zone 1 area of the City of Renton's sole source aquifer but will occur within areas of existing or newly-acquired right of

way adjacent to the mainline. The contractor may also find other locations for staging.

***What is the project construction schedule?***

Construction is expected to take place in steps, with the entire construction phase lasting at least five years. It is likely that sections of the Renton to Bellevue Project will be constructed in two steps. WSDOT expects that during the first step, traffic will be maintained on the current roadway while the new roadway is constructed to the outside. The first step of construction will include the following activities:

- Utility relocation;
- Construction of drainage and stormwater treatment facilities;
- Grading and paving for new roadway;
- Retaining wall construction;
- Bridge demolition and construction; and
- Environmental improvements.

During subsequent steps, traffic will be shifted to the previously constructed portion so that we can remove and reconstruct existing lanes.

***What is the No Build Alternative?***

The No Build Alternative is WSDOT's continued routine maintenance. These activities include short-term minor construction necessary for continued operation of the existing I-405 facility and minor safety improvements, as required, within the project limits.